U.S. Application No.: 10/535,157
Amendment A
Reply to Office Action Dated January 22, 2007

Attorney Docket No: 3926.150

REMARKS

Claims 1-7 and 9 are pending in the application. Claim 1 has been amended. Claim 8 has been previously cancelled.

Present Invention

Surrounding-sensing systems are used to warn driver about obstacles and other sources of danger and thus avoid traffic accidents. The prior art surrounding-sensing systems require a large amount of data to be evaluated and is thus very disadvantageous under real conditions. Until the present invention, very complex and also very expensive special hardware has been used in systems for sensing the surroundings.

The object of the present invention is to provide a method with which a real-time capability of the surroundings sensing system is implemented by a simple data processing means.

To achieve the above object, the present invention provides a method for sensing surroundings in front of a road vehicle by means of a surroundings sensing system, in which surroundings data is obtained by means of a surroundings sensor, and objects are detected by processing the surroundings data, the method comprising:

determining a perception region in which the objects are detected corresponding to a sub-region of a region sensed by the surroundings sensor,

dividing the perception region into a plurality of component-regions,

subjecting the surroundings data to a multi-stage evaluation based on the division of the perception region,

defining a lane before the perception region is divided into a plurality of

(WP369636;1)

- 5 -

U.S. Application No.: 10/535,157
Amendment A
Reply to Office Action Dated January 22, 2007

Attorney Docket No: 3926.150

      component-regions and subsequently restricting the perception region to the lane,

          subjecting each of these component-regions to a specific evaluation, and

          issuing a warning to a driver of the road vehicle based on a result of the

evaluation.

      The advantage of the inventive method of the present invention is that the quantity of
data to be evaluated is considerably reduced, thus permitting rapid processing of the data for the
sensing of the surroundings.

Detailed Action

      Turning now to the detailed action.

Specification

      In item 3 on page 2 of the Office action, the disclosure is objected to because it contains
an embedded hyperlink and/or other form of browser-executable code.

      Appropriate correction has been made.

      In item 4 on page 2 of the Office action, the disclosure is objected to because of the
acronym "ACC" in paragraph [00020] is undefined.

      The acronym "ACC" is now defined as "adaptive cruise control."

      In item 5 on page 3 of the Office action, the specification is objected to as failing to
provide proper antecedent basis for the claimed subject matter. More specifically, the Examiner
has stated the limitation "evaluation takes place in one component-region and no evaluation takes

{WP369636;1}

- 6 -

U.S. Application No.: 10/535,157
Amendment A
Reply to Office Action Dated January 22, 2007

Attorney Docket No: 3926.150

place in another component-region" of claim 1, lines 13-15, cannot be found in the application as filed and translations of the international application.

The limitation has been deleted although it is mentioned in the specification of the instant application that due to the division into such perception sub-regions, surrounding data can be subjected to specific evaluation, for example, with different priority or different computing power.

Claims Objections

Claim 1 is objected to because of informalities.

Claim 1 has been amended to overcome the objections. The language of claim 1 has also been modified to conform it to the style of a method claim used in US patent practice.

Claim Rejections - 35 U.S.C. § 112

Claims 1-7 and 9 are rejected under 35 USC 112, second paragraph, as being indefinite.

More specifically, the Examiner has stated that the limitation "each of these component-regions is subjected to a specific evaluation" and the limitation "evaluation takes place in one component-region and no evaluation takes place in another component-region" are at odds with each other because a component-region cannot be subjected to a specific evaluation if no evaluation takes place.

The limitation "evaluation takes place in one component-region and no evaluation takes place in another component-region" has been deleted, although the Examiner has correctly interpreted no evaluation as a form of a specific evaluation.

{WP369636;1}

- 7 -

U.S. Application No.: 10/535,157
Amendment A
Reply to Office Action Dated January 22, 2007

Attorney Docket No: 3926.150

Claim Rejections - 35 U.S.C. § 101

Claims 1-7 and 9 are rejected under 35 USC 101 because the claimed invention is directed to non-statutory subject matter.

More specifically, the Examiner has stated that merely subjecting each of the component-regions to a specific evaluation would not appear to be sufficient to constitute a tangible result, since the outcome of the subjecting step has not been used in a disclosed practical application nor made available in such a manner that its usefulness in a disclosed practical application can be realized.

A limitation "issuing a warning to a driver of the road vehicle based on a result of the evaluation" has been added to claim 1 in order to use the outcome of the subjecting step in a practical application, namely giving warnings to the driver.

Claim Rejections - 35 U.S.C. § 103

Claims 1-2, 4-6, and 9 are rejected under 35 USC 103(a) as being unpatentable over Saka et al. (US 6,792,147) in view of Morizane et al. (US 2002/0026274) and Yamada (US 6,369,700).

Claim 3 is rejected under 35 USC 103(a) as being unpatentable over Saka et al., Morizane et al. and Yamada and further in view of Nishigaki et al. (US 6,775,395).

Claim 7 is rejected under 35 USC 103(a) as being unpatentable over Saka et al., Morizane et al. and Yamada and further in view of Falbish et al. (EP 0 544 468 A2).

Saka et al. disclose an object recognition system for recognizing the outline of an object ahead of a vehicle from horizontal and/or vertical edges. Saka et al. have nothing to do with the

{WP369636;1}

- 8 -

U.S. Application No.: 10/535,157
Amendment A
Reply to Office Action Dated January 22, 2007

Attorney Docket No: 3926.150

object of the present invention, namely reducing the quantity of data to be evaluated. Fig. 10 of Saka et al. shows a binarization of a part of the image, which is different from dividing the perception region into a plurality of component-regions as recited in claim 1 of the instant application. The perception region is determined before an object has been detected and for the purpose to detect an object with reduced data processing. In contrast, the region shown in Fig. 10 is obtained after an object has already been detected and for purpose to obtain the outline of the object.

Although the reference Morizane et al. discloses a lane recognition process portion (see Fig. 3), it does not disclose restricting the perception region to the lane. Yamada discloses reducing data to be processed by limiting a scanning range of the radar beams to the shape of the lane.

However, the combination of the limitations of claim 1 of the instant application is not disclosed by any of the cited reference or combination thereof.

Favorable consideration and early issuance of the Notice of Allowance are respectfully requested. **Should further issues remain prior to allowance, the Examiner is respectfully requested to contact the undersigned at the indicated telephone number.**

Respectfully submitted,

Date: **March 1, 2007**

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{WP369636;1}

- 9 -